NOvA Experiment Status

Steve Magill Argonne National Laboratory

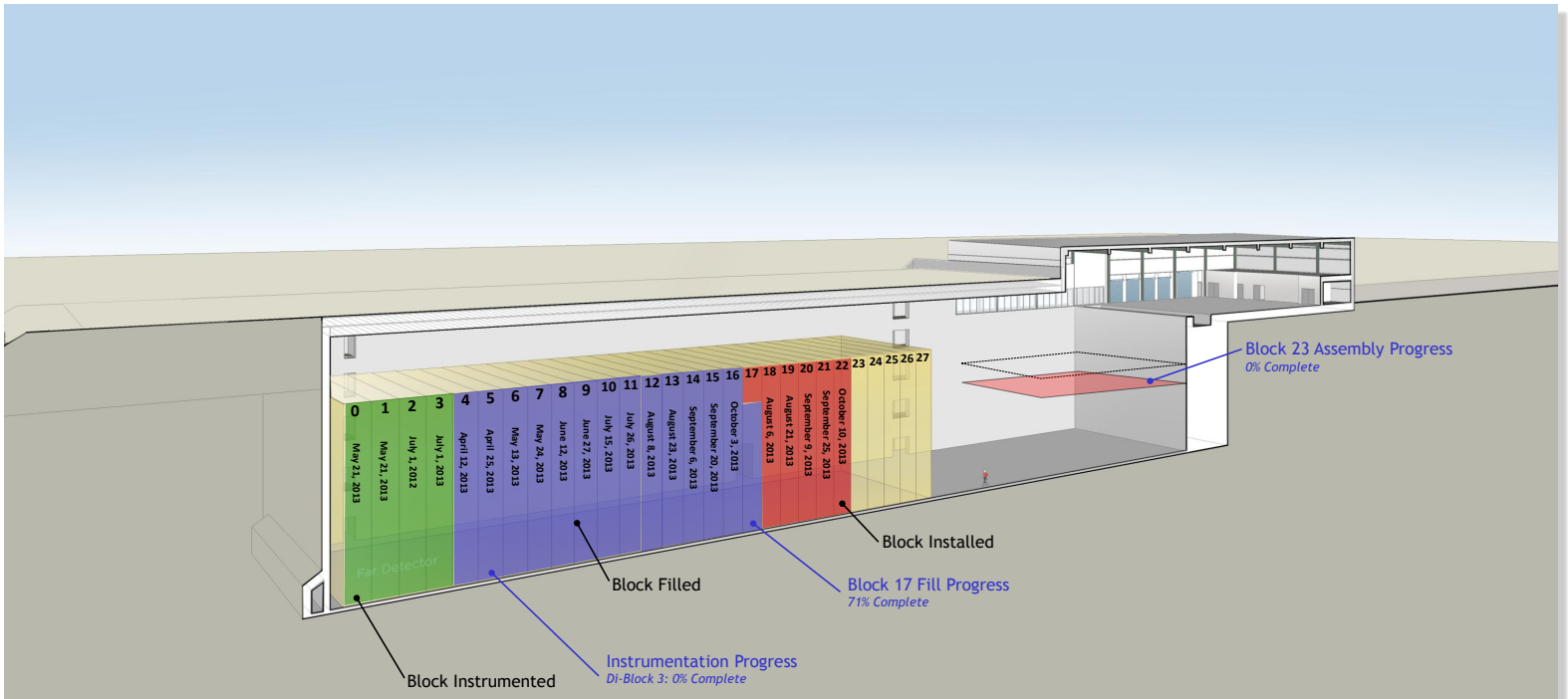
All Experimenter's Meeting, October 21, 2013

Far Detector Progress

The Intensity Frontier

NOvA Far Detector Assembly Progress

Status Date: 14OCT13



14 kilotons = 28 NOvA Blocks

23 blocks of PVC modules are assembled and installed in place
17.71 blocks are filled with liquid scintillator
4.00 blocks are outfitted with electronics

S. Dixon

APD Noise

The Noise problem in 1 page

- Noise was absent for the first couple of months of installation
- Noise problem on the detector does not appear immediately on installation, takes hours for it to develop, and can decrease over time as well.
  - Standard tests over 4-5 minutes did not show any problems. Longer duration tests ("Soak" test) on the test stand were needed to observe the behavior
- Noise varies from batch to batch in production. It is not clear what it is correlated with that drives the variation between batches, and how well it correlates with noise on the detector

What we have learned

- No fluorescence detected, so noise is not light.
- Noise excursions appear to be unrelated to handling or cleaning methods prior to coating (first suspects)
- Noise appears on essentially all parts with adhesion promoter (Silane A174) applied before coating
- Excursions on parts with A174 applied can be driven away with baking
- Noise can be largely prevented with parylene coating without A174 step
- Plausible noise/conduction mechanism proposed by Anna Pla-Dalmau, consistent with data
- Cooling appears to help reduce noise on detector as well

The Road Ahead

- Working on the path forward on two fronts:
  - Not coated:
    - Tested parts without A174 adhesion promoter
    - Tested good on test stand and NDSBTest stand
    - Temperature cycled for adhesion tests
    - Plan to produce and install 1 diblock of this type ASAP
  - Coated:
    - Cooled running appears to reduce the noise
    - Working on a baking treatment to refurbish parts coated with A174
    - Initial tests promising, running cool may be an additional help
    - Uncertain if it is a permanent fix.
    - Aging test parts were baked >6 months and still look good.
    - Plan to bake and install 1 diblock of this type ASAP

Near Detector Status

Near Detector Status (T.Miao)

Block	Modules from Minneapolis	Assembly Complete	Installation Underground complete	Scintillator filled	Electronics installed (FEB & APD)
μ catcher	Apr 07	Aug 01	Aug 01	~Nov 1/ 17 Jan	Nov - Jan
1	May 21	Aug 14	Aug 21	24 Jan	Jan/Feb
2	June 20	Sept 12	Sept 25	31 Jan	Jan/Feb
3	Aug 08	Oct 01	Oct 7/Oct 9	7 Feb	Jan/Feb
4	Sept 17	Oct28/Oct 14	Nov 4	14 Feb	Jan/Feb
5	Sept 24	Nov 5	Nov 11	28 Feb	Jan/Feb
6	Oct 11	Nov 21	Nov 25	7 Mar	Jan/Feb
7	Nov 01	Dec 12	Dec 16	14 Mar	Jan/Feb
8	Nov 22	Jan 8	Jan 8	28 Mar	Jan/Feb

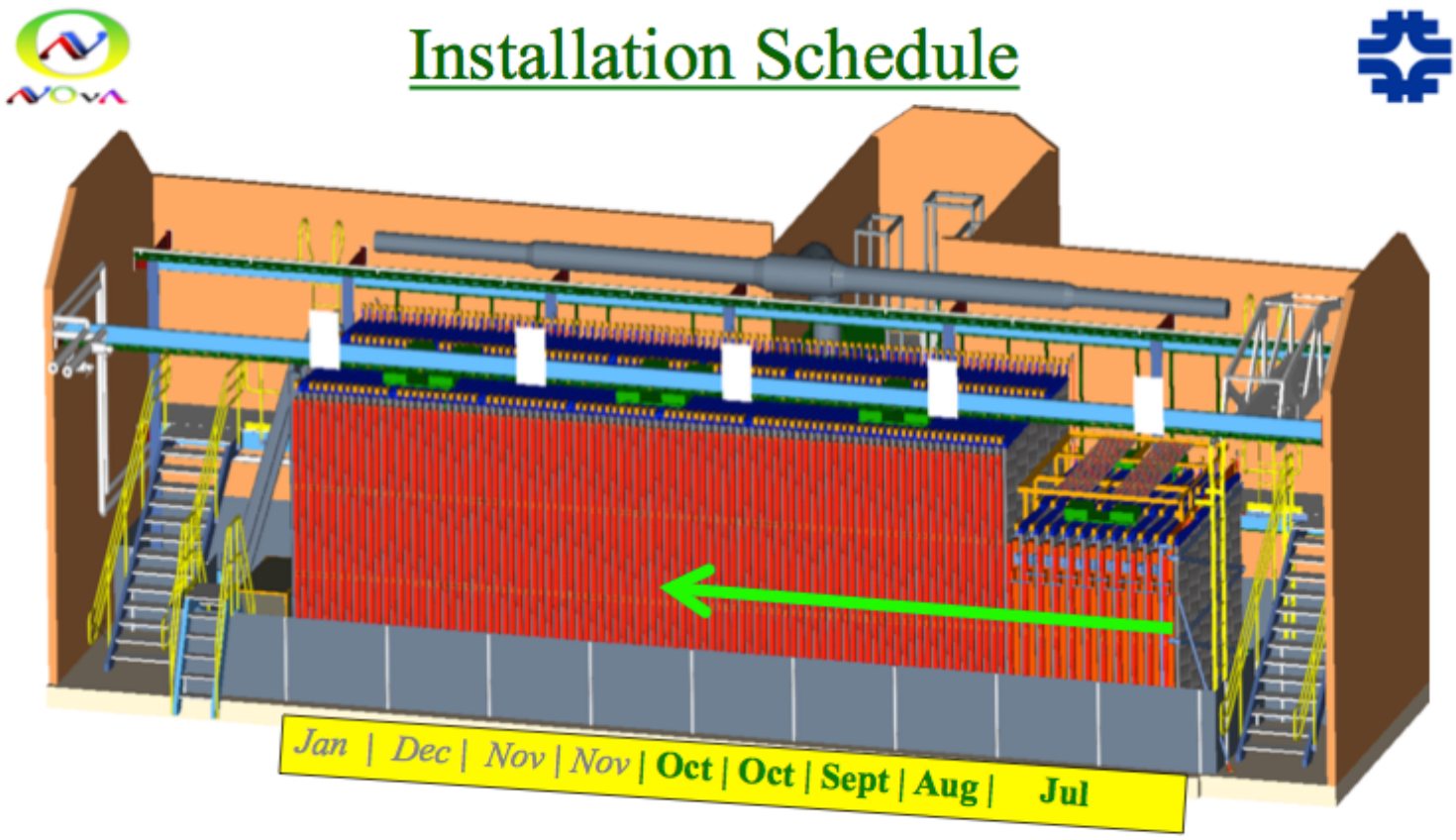
- **Done**, ** = in progress, Estimated on 10/7, Est 10/15, In planning stage
- ESH&Q pushing us to fill after all blocks are inside secondary containment
- Electronics is critical path, FEBs in January (1st 16 in November)
- Use scintillator from Wolf Lake supply for near detector
- Cost ~$150k

ND Block Construction

Block 5 under construction
- 6 layers (out of 24) glued

Block 4 underground

Near Detector Schedule



Muon catcher + 4 PVC blocks installed - Oct 21
ND installation to be completed by early Jan 2014